

2. The camera of claim 1 wherein the amplifier applies different gain levels to different regions of the captured image.
3. The camera of claim 1 wherein the processor generates a gain map containing gain settings applied to the sensor output signal by the amplifier.
4. The camera of claim 3 wherein the gain map is continually updated by the processor to include changes in the captured image.
5. The camera of claim 3 wherein the gain map is a two dimensional array of gain settings, each gain setting indicating a particular gain applied by the amplifier to a corresponding region of the captured image.
6. The camera of claim 3 further including a register coupled to the processor and the amplifier.
7. The camera of claim 6 wherein the gain map is stored in the register and the amplifier reads the gain settings from the register.
8. The camera of claim 1 wherein the processor provides the control signal to the amplifier in real-time.
9. The camera of claim 1 wherein the processor analyzes the sensor output signal to determine whether a sufficient level of detail is provided in the sensor output signal.
10. The camera of claim 9 wherein the processor increases the gain levels in dark portions of the captured image and the processor decreases the gain levels in bright portions of the captured image.
11. An apparatus for capturing an image, comprising a camera, including:
 - 30 a sensor configured to capture the image and generate a sensor output signal representing the captured image;
 - 35 an amplifier coupled to receive the sensor output signal, wherein the amplifier has controls to apply multiple gain levels to the sensor output signal; and
 - 35 a processor coupled to the camera, wherein the processor is configured to receive the sensor output signal, and wherein the processor is configured to provide a control signal to the amplifier to adjust the gain level applied by the amplifier.
12. The apparatus of claim 11 wherein the processor generates a gain map containing gain settings applied to the sensor output signal by the amplifier.
13. The apparatus of claim 12 wherein the gain map is a two dimensional array of gain settings, each gain setting indicating a particular gain applied by the amplifier to a region of the captured image.
14. The apparatus of claim 13 wherein the processor divides the captured image into a two dimensional array of image regions, each image region associated with a corresponding gain setting in the gain map.
15. The apparatus of claim 12 wherein the camera further includes a register coupled to the processor and the amplifier.
16. The apparatus of claim 15 wherein the gain map is stored in the register and the amplifier reads the gain settings from the register.
17. A method for enhancing the dynamic range of a sensor output signal representing a captured image, the method comprising the steps of:
 - 60 amplifying the sensor output signal in response to gain settings contained in a gain map, wherein each gain setting is associated with a particular region of the captured image; and
 - 65 updating the gain settings contained in the gain map in response to changes in the sensor output signal.
18. The method of claim 17 wherein the step of updating the gain settings is performed in response to clipping of the amplified sensor output signal.

What is claimed is:

1. A camera comprising:
 - a sensor configured to capture an image and generate a sensor output signal representing the captured image;
 - 60 an amplifier coupled to receive the sensor output signal, wherein the amplifier is configured to apply multiple gain levels to the sensor output signal; and
 - a processor coupled to the amplifier, wherein the processor is configured to provide a control signal to the amplifier to adjust the gain levels applied by the amplifier.

19. The method of claim 17 wherein the step of updating the gain settings includes increasing the gain settings in dark portions of the image and reducing the gain settings in bright portions of the image.

20. The method of claim 17 wherein the step of updating the gain settings includes dividing the captured image into a plurality of image regions, wherein each image region is associated with a particular gain setting in the gain map.

21. The method of claim 17 further including the step of 10 analyzing each image region and updating the associated gain setting in response to clipping of the amplified sensor output signal in the image region.

22. An apparatus for capturing an image and generating a signal representing the captured image, comprising:

means for amplifying the signal in response to gain settings contained in a gain map, wherein each gain setting is associated with a particular region of the captured image;

means for updating the gain settings contained in the gain map; and

means for generating a control signal indicating a particular gain setting to be applied to a portion of the signal representing the captured image.

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